

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2
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4. One or more computer-readable media as recited in claim 3, wherein the intended target comprises another node in the co-location facility.

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- 1 5. One or more computer-readable media as recited in claim 3, wherein
2 the intended target comprises at least one of the components executing on the
3 node.
4
- 5 6. One or more computer-readable media as recited in claim 1, wherein
6 the beginning and terminating execution of components comprises beginning and
7 termination execution of the components based on commands received from an
8 operations console at a location remote from the co-location facility.
9
- 10 7. One or more computer-readable media as recited in claim 1, wherein
11 one of the components comprises an operating system.
12
- 13 8. A system comprising:
14 a plurality of node clusters, each node cluster including a plurality of nodes;
15 and
16 wherein each individual node includes a controller to enforce restrictions on
17 which other nodes the individual node can receive data from and which other
18 nodes the individual node can send data to.
19
- 20 9. A system as recited in claim 8, wherein each individual node further
21 includes a plurality of filters that identify the restrictions.
22
23
24
25

10. A system as recited in claim 8, wherein the restrictions prevent the individual node from sending data to or receiving data from another node that is not in the same node cluster as the individual node.

11. A system as recited in claim 8, wherein each individual node includes a network interface adapter that includes the controller.

12. A system as recited in claim 8, wherein for each of the plurality of nodes:

a plurality of management devices share management responsibility for the node; and

one of the plurality of management devices is given an extended set of management rights over the node, and the remaining management devices is given a more restricted set of management rights over the node.

13. A system as recited in claim 8, wherein the controller in each node is further to terminate and initiate execution of applications on the node in response to requests from an external management device.

14. A system as recited in claim 8, wherein the plurality of node clusters are included in a co-location facility.

15. A method comprising:

receiving, at a node in a co-location facility, a first request from a first control console that is local to the co-location facility;

1 implementing the first request;
 2 receiving, at the node, a second request from a second control console that
 3 is remote from the co-location facility; and
 4 implementing the second request.

5
 6 **16.** A method as recited in claim 15, wherein the first request comprises
 7 hardware operation oriented commands.

8
 9 **17.** A method as recited in claim 15, wherein the second request
 10 comprises software application control oriented commands.

11
 12 **18.** A method as recited in claim 15, wherein the first request
 13 corresponds to one of a first set of rights that are granted to the first control
 14 console, wherein the second request corresponds to one of a second set of rights
 15 that are granted to the second control console, and wherein the first set of rights is
 16 more restricted than the second set of rights.

17
 18 **19.** One or more computer-readable memories containing a computer
 19 program that is executable by a processor to perform the method recited in claim
 20 15.

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1 **20.** One or more computer-readable media having stored thereon a
2 computer program that, when executed by one or more processors of a node in a
3 facility, causes the one or more processors to perform acts including:

4 establishing a boundary of a server cluster in the facility, wherein the server
5 cluster includes the node; and

6 altering the boundary of the server cluster based on commands received
7 from a console outside the server cluster.

8
9 **21.** One or more computer-readable media as recited in claim 20,
10 wherein the establishing comprises including a filter that restricts access to another
11 node that is in the facility but that is not in the server cluster.

12
13 **22.** One or more computer-readable media as recited in claim 20,
14 wherein the establishing comprises generating a plurality of filters identifying only
15 other nodes in the server cluster as being permissible to access.

16
17 **23.** One or more computer-readable media as recited in claim 20,
18 wherein the computer program, when executed, further causes the one or more
19 processors to perform acts including executing a software engine in response to a
20 command received from the console.

21
22
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24. One or more computer-readable media as recited in claim 20,
wherein the computer program, when executed, further causes the one or more
processors to perform acts including terminating execution of a software engine in
response to a command received from the console.

25. One or more computer-readable media as recited in claim 20,
wherein the facility comprises a co-location facility.

9 || 26. A system comprising:

an interface allowing management devices corresponding to a plurality of management agents responsible for managing the system to access the system; and a controller to operate as a trusted third party mediating interaction among the plurality of management agents by assigning each of the plurality of management agents to a different one of a plurality of ownership domains and restricting the rights of each ownership domain in the system.

27. A system as recited in claim 26, wherein the controller is further to
terminate execution of a software engine in the system in response to a request
from a management device corresponding to one of the plurality of management
agents.

22 **28.** A system as recited in claim 26, wherein the controller is further to
23 initiate execution of a software engine in the system in response to a request from
24 a management device corresponding to one of the plurality of management agents.

29. A system as recited in claim 26, wherein one of the plurality of ownership domains is a top-level ownership domain having a first set of rights, and wherein each of the other ownership domains in the plurality of ownership domains has a second set of rights.

30. A system as recited in claim 29, wherein the second set of rights is more restrictive than the first set of rights.

31. A system as recited in claim 29, wherein the first set of rights includes: the right to create new ownership domains, the right to access system memory, the right to access a mass storage device of the system, the right to modify filters in the system, the right to start execution of software engines in the system, the right to stop execution of software engines in the system, the right to debug software engines in the system, the right to change authentication credentials for the ownership domain, the right to modify a storage key for the ownership domain, and the right to subscribe to events engine events, machine events, and packet filter events at the system.

32. A system as recited in claim 29, wherein the second set of rights includes: the right to revoke an existing ownership domain, the right to modify filters in the system, the right to change authentication credentials for the ownership domain, and the right to subscribe to machine events and packet filter events at the system.

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1 **33.** A system as recited in claim 29, wherein the first set of rights
2 includes: the right to create new ownership domains, the right to access system
3 memory, the right to access a mass storage device of the system, and the right to
4 modify filters in the system.

5
6 **34.** A system as recited in claim 29, wherein the second set of rights
7 includes: the right to revoke an existing ownership domain and the right to modify
8 filters in the system, including the right to add a filter that cannot be subverted by
9 a management agent assigned to the top-level ownership domain.

10
11 **35.** A system as recited in claim 29, wherein the controller allows a
12 device corresponding to any one of the other ownership domains to revoke the
13 top-level ownership domain, and wherein the controller erases a system memory
14 during the revocation process.

15
16 **36.** A system as recited in claim 26, wherein only one of the plurality of
17 management agents can correspond to a top-level ownership domain at a time, and
18 wherein any of the other management agents can revoke the top-level ownership
19 domain.

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1 **37.** A system as recited in claim 26, wherein only one of the plurality of
2 management agents can correspond to a top-level ownership domain at a time, and
3 wherein the one management agent can create a new ownership domain for a new
4 management agent, and wherein the new ownership domain becomes the new top-
5 level ownership domain.

6
7 **38.** A system as recited in claim 26, wherein only one of the plurality of
8 management agents can correspond to a top-level ownership domain at a time,
9 wherein which of the plurality of management agents corresponds to the top-level
10 ownership domain at any given time can vary over time, and wherein the
11 controller erases a system memory each time a change occurs in which of the
12 plurality of management agents corresponds to the top-level ownership domain.

13
14 **39.** A system as recited in claim 26, wherein the system comprises a
15 node in a co-location facility.

16
17 **40.** A method comprising:
18 associating each of a plurality of management agents with one of a plurality
19 of ownership domains, wherein each of the plurality of management agents is
20 responsible for managing at least a portion of a computer and is external to the
21 computer;

22 allowing only one of the plurality of management agents to have an
23 extended set of rights to the computer at a time, and assigning the remaining
24 management devices a more limited set of rights; and
25

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1 restricting which requests from management devices corresponding to the
2 plurality of management agents are carried out based at least in part on the rights
3 of the management agent.

4
5 **41.** A method as recited in claim 40, where each of the plurality of
6 management agents corresponds to one or more management devices that are
7 coupled to the computer.

8
9 **42.** A method as recited in claim 40, wherein the extended set of rights
10 includes: the right to create new ownership domains, the right to access system
11 memory, the right to access a mass storage device of the system, the right to
12 modify filters in the system, the right to start execution of software engines in the
13 system, the right to stop execution of software engines in the system, the right to
14 debug software engines in the system, the right to change authentication
15 credentials for the ownership domain, the right to modify a storage key for the
16 ownership domain, and the right to subscribe to events engine events, machine
17 events, and packet filter events at the system.

18
19 **43.** A method as recited in claim 40, wherein the more limited set of
20 rights includes: the right to revoke an existing ownership domain, the right to
21 modify filters in the system, the right to change authentication credentials for the
22 ownership domain, and the right to subscribe to machine events and packet filter
23 events at the system.

1 **44.** A method as recited in claim 40, wherein the extended set of rights
2 includes: the right to create new ownership domains, the right to access system
3 memory, the right to access a mass storage device of the system, and the right to
4 modify filters in the system.

5
6 **45.** A method as recited in claim 40, wherein the more limited set of
7 rights includes: the right to revoke an existing ownership domain and the right to
8 modify filters in the system, including the right to add a filter that cannot be
9 subverted by a management agent assigned to the top-level ownership domain.

10
11 **46.** A method as recited in claim 40, wherein the one management agent
12 corresponds to a top-level ownership domain, and wherein any of the other
13 management agents can revoke the rights of the one management agent.

14
15 **47.** A method as recited in claim 40, further comprising:
16 assigning, by the one management agent having the extended set of rights,
17 the extended set of rights to a new management agent;
18 assigning the one management agent to having the more limited set of
19 rights.

20
21 **48.** A method as recited in claim 40, further comprising:
22 allowing which of the plurality of management agents has the extended set
23 of rights to change over time; and
24 erasing a system memory each time a change occurs in which of the
25 plurality of management agents has the extended set of rights.

